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(71)出願人 000206211

大成建設株式会社

東京都新宿区西新宿一丁目25番1号

(72)発明者 柳澤 孝次

東京都新宿区西新宿一丁目25番1号 大成建設株式会社内

(72)発明者 小竹 達也

東京都新宿区西新宿一丁目25番1号 大成建設株式会社内

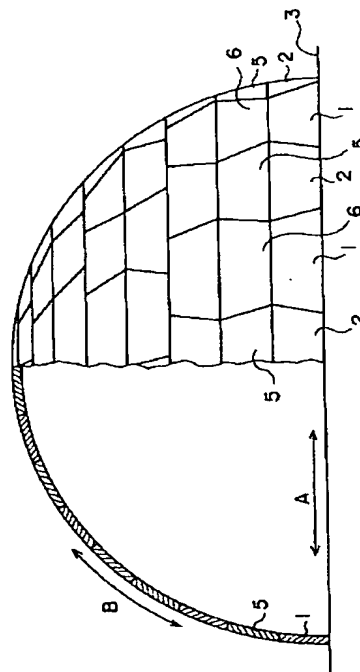
(74)代理人 弁理士 森 哲也 (外2名)

(54)【発明の名称】 ドーム・シェル架構

(57)【要約】

【目的】構面を形成する板部材同士の接合が簡易な構造のドーム・シェル架構を提供することを目的としている。

【構成】第1板部材1を第2板部材2が挿入可能な間隔をあけて緯線方向Aに沿って設置する。第2板部材2を上記第1板部材1間に嵌め込み、1層目の構面を形成する。板部材1、2の上端面のほぞ穴1a、2aにほぞ材4を差し込む。次に、上記と同様にして、上記構築した1層目の板部材1、2の上へ、第1板部材5及び第2板部材6を乱に積み重ねていく。このとき、ほぞ穴間をほぞ材4で連結する。上記施工を、順次、構築するドーム・シェルの頂部まで経線方向Bに沿って層状に積み込んで、所望のドーム・シェル架構が構築されている。



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【特許請求の範囲】

【請求項 1】 略台形形状に成形されて上下両端面にそれぞれほぞ又はほぞ穴をもつ複数の板部材が、構築するドームシェルの緯線方向に上下を交互に逆に向けて配列されて組み付けられ、かつ、構築するドームシェルの経線方向には、上記ほぞ又はほぞ穴を介して上下に接合されていると共に乱に積み重ねられていることを特徴とするドーム・シェル架構。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、複数の板部材を接合してドーム・シェルの構面を構成するドーム・シェル架構に関するものである。

【0002】

【従来の技術】 従来のドームの構築では、例えば、構築するドームの構面の曲面に合わせて、略長方形のプレキャスト板 10 を、図 6 に示すように、緯線方向 A に並べるように接合すると共に、経線方向 B には、頂点に向けて揃うように接合して半球状のドーム・シェル架構が構成されている。

【0003】 このとき、上記プレキャスト板 10 同士の接合は、板 10 に内蔵されている鋼材をスリーブや溶接にて結合することで実施されている。

【0004】

【発明が解決しようとする課題】 しかしながら、上記のようなドーム・シェル架構では、構築の際、構面を形成するプレキャスト板 10 同士の接合のために溶接等のような施工作業を必要として、手間が掛かると共にコストが掛かるという問題がある。本発明は、上記のような問題点に着目してなされたもので、構面を形成する板部材同士の接合が簡易な構造のドーム・シェル架構を提供することを目的としている。

【0005】

【課題を解決するための手段】 上記目的を達成するために、本発明のドーム・シェル架構は、略台形形状に成形されて上下両端面にそれぞれほぞ又はほぞ穴をもつ複数の板部材が、構築するドームシェルの緯線方向に上下を交互に逆に向けて配列されて組み付けられ、かつ、構築するドームシェルの経線方向には、上記ほぞ又はほぞ穴を介して上下に接合されていると共に乱に積み重ねられていることを特徴としている。

【0006】

【作用】 本願発明のドーム・シェル架構にあっては、略台形形状の板部材と倒立させた略台形形状の板部材とを、交互に緯線方向に沿って並べて組み付けることで、板部材の側方の端面同士が相互に噛み合わされた状態となって接合され、もって、緯線方向に沿ってリング状の構面が形成されている。

【0007】 また、経線方向に対しては、乱積みにすると共に、上下のほぞとほぞ穴を相互に嵌合したり、上下

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に対向するほぞ穴間をほぞ材で連結することで簡単に接合され、もって、全体としてドーム・シェル架構が構成されている。

【0008】

【実施例】 本発明の実施例を図面に基つて説明する。ドームシェル架構の構面を構成するために使用される板部材には、図 2 (a) に示すような、略台形形状に成形されたプレキャスト版からなる第 1 板部材 1 と、図 2 (b) に示すような、倒立した略台形形状に成形されたプレキャスト版からなる第 2 板部材 2 との 2 種類が使用される。

【0009】 その 2 種類の板部材 1, 2 の上下両端面には、それぞれ 2 個のほぞ穴 1 a, 2 a が軸を上下に開設され、また、板部材 1, 2 の表面が、それぞれ構成するドームの構面に合わせた曲面になっている。そして、第 1 板部材 1 を、図 3 に示すように、所定の基礎 3 上に第 2 板部材 2 が挿入可能な間隔をあけて、構築するドームの緯線方向 A に沿って並列させて設置する。

【0010】 このとき、基礎 3 上に、予め、構築するドームの緯線方向 A に沿って複数のほぞ材を突設させておいて、そのほぞ材が板部材の下端面のほぞ穴 1 a, 2 a に嵌入するように、該第 1 板部材 1 を吊るし降ろしたりなどして、該第 1 板部材 1 を基礎 3 に固定するとよい。次に、第 2 板部材 2 を上記第 1 板部材 1 間に上から吊るし込んで嵌め込み、第 1 板部材 1 と相互に噛み合わせた状態として、リング状になった 1 層目の構面を形成する。

【0011】 次に、上記 1 層目を形成する板部材 1, 2 の上端面のほぞ穴 1 a, 2 a にそれぞれほぞ材 4 を差し込んで該ほぞ材 4 を突出状態にしたのち、上記板部材 1, 2 より略小さめの相似形の第 1 板部材 5 及び第 2 板部材 6 を用意して、上記と同様にして、構築するドームシェルにおける 2 層目の緯線方向 A に沿って、即ち上記構築した 1 層目の板部材 1, 2 の上へ、図 4 に示すように、第 1 板部材 5 を間欠的に吊り込んで積み重ねていく。

【0012】 このとき、積み込む第 1 板部材 5 の下端面に開設した 2 つのほぞ穴 5 a のうち、一方のほぞ穴を一層目の第 1 板部材 1 のほぞ穴 1 a と上下に対向させ、他方のほぞ穴を一層目の第 2 板部材 2 のほぞ穴 2 a に上下に対向させるように降ろすことで、ほぞ材 4 を介して 2 層目の第 1 板部材 5 が第 1 層目の板部材 1, 2 の上へ乱に積み重ねられる。

【0013】 次に、第 2 板部材 6 を、第 1 板部材 5 間に上から吊り降ろして嵌め込むと共に、その下端面のほぞ穴 6 a を、第 1 層目の板部材 1, 2 上端面から突出しているほぞ材 4 を嵌入させて固定し、もって、2 層目の構面が形成される。上記施工を、順次、大きさを小さく設計した板部材を使用しながら、順次、構築するドーム・シェルの頂部まで経線方向 B に沿って層状に積み込ん

で、所望のドーム・シェル架構を構築する。

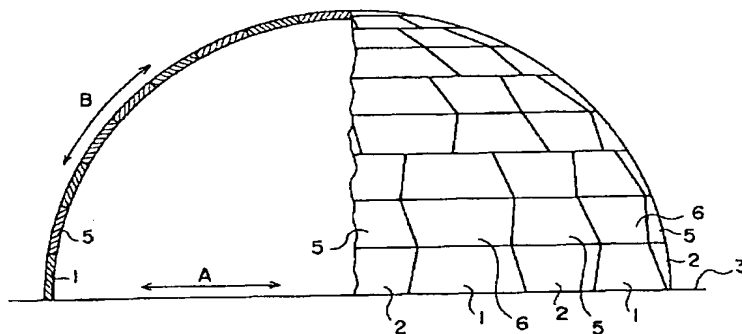
【0014】このように、本実施例のドーム・シェル架構では、2種類の板部材を上から吊り降ろして組み付けていだけで、板部材同士が、ほぞ穴を介して若しくは面接触によって所定の強度で接合されるので、板部材間の接合作業が従来よりも簡易となり、ドーム・シェル構築のための工程が短縮されると共にコストが低くなる。

【0015】上記のようにして構築されたドーム・シェル架構は、例えば図1及び図5に示すような構造となる。なお、この図1及び図5のドーム・シェル架構構造では、上記説明の経線方向Bへの積み重ね方を変えて、1層目の第1板部材1の上に2層目の第2板部材6が上下に重なるように積み重ねている。このように、経線方向Bへの乱積み形状は、接触している上下層間の緯線方向Aの位相さえずれていれば、他の乱積み形状を採用してもよい。

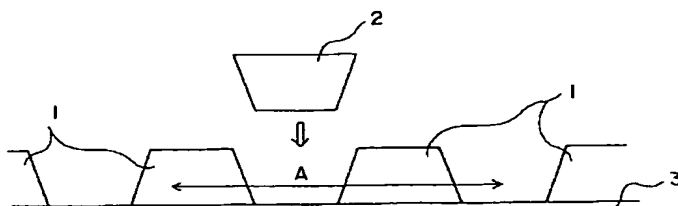
【0016】なお、板部材の自重によって、上層にいくほど設計ラインよりも下方に撓んで、板部材間がより圧着される。また、上記実施例では、上下の板部材のほぞ穴同士をほぞ材4で連結しているが、板部材の上端面若しくは下端面のいずれかから鋼材等のほぞを予め突設させるように成形しておいて、直接連結するようにしてもよい。

\*

【図1】



【図3】



\*【0017】

【発明の効果】以上説明してきたように、本発明のドーム・シェル架構では、板部材間の接合が簡易となり、架構構築の工程が短縮されると共にコストが低くなるという効果がある。

【図面の簡単な説明】

【図1】本発明に係る実施例のドーム・シェル架構を示す一部省略した側面図である。

【図2】本発明に係る実施例の板部材を示す図である。

【図3】本発明に係る実施例の1層目の緯線方向への組付けを示す図である。

【図4】本発明に係る実施例の2層目の組付けを示す図である。

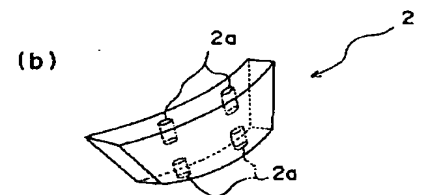
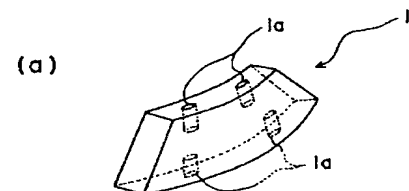
【図5】本発明に係る実施例のドーム・シェル架構を示す一部省略した平面図である。

【図6】従来のドーム・シェル架構を示す一部省略した側面図である。

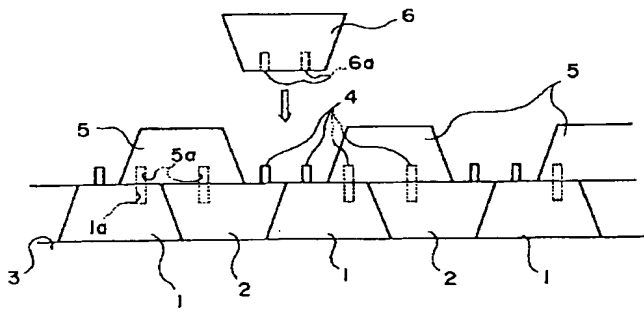
【符号の説明】

- |        |       |
|--------|-------|
| 1, 5   | 第1板部材 |
| 2, 6   | 第2板部材 |
| 1a, 2a | ほぞ穴   |
| 4      | ほぞ材   |

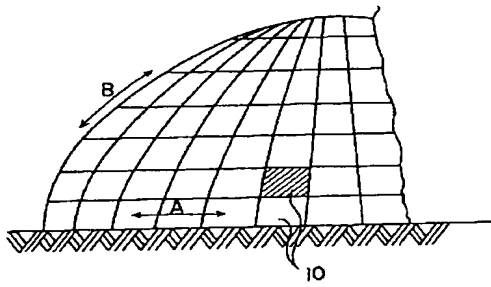
【図2】



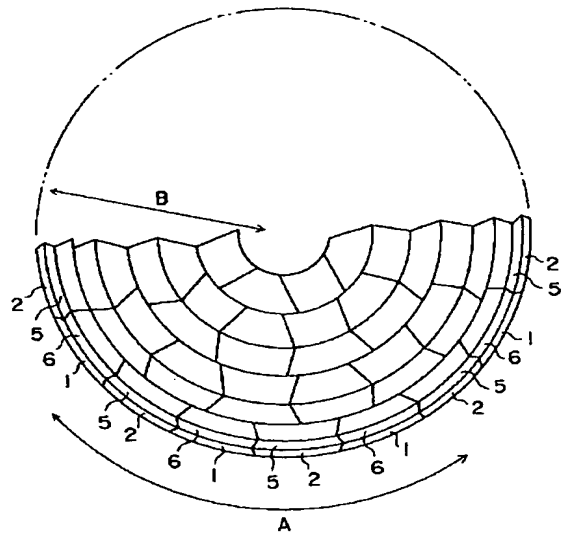
【図 4】



【図 6】



【図 5】



## PATENT ABSTRACTS OF JAPAN

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(71)Applicant : TAISEI CORP

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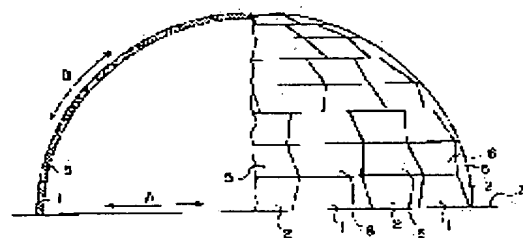
(72)Inventor : YANAGISAWA KOJI  
KOTAKE TATSUYA

## (54) DOME-SHELL FRAME

## (57)Abstract:

PURPOSE: To form the mutual connection of plate members forming the plane of structure in simple structure.

CONSTITUTION: First plate members 1 are installed along the direction of a circle A at intervals, in which second plate members 2 can be inserted. The second plate members 2 are fitted among the first plate members 1, thus forming the plane of structure as a first layer. Tenon materials 4 are inserted into the mortices 1a, 2a of the upper end faces of the plate members 1, 2. likewise, first plate members 5 and second plate members 6 are superposed gradually on the constructed plate members 1, 2 as the first layer at random. Sections among the mortices are connected by the tenon materials 4 at that time. These execution is superposed successively along the direction of a longitude line B up to the top section of a constructed dome-shell in a stratiform shape, thus building a desired dome-shell frame.



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CLAIMS

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[Claim(s)]

[Claim 1]Two or more sheet members which are fabricated by approximately trapezoidal shape and have a tenon or a mortise in a top-and-bottom-ends side, respectively, A dome shell engine frame which turns the upper and lower sides conversely by turns in the direction of latitude lines of dome shell to build, is arranged, and is attached at it, and is characterized by being joined up and down via the above-mentioned tenon or a mortise, and being put upon \*\* in a longitudinal direction of dome shell to build.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the dome shell engine frame which joins two or more sheet members and constitutes the plane of structure of dome shell.

[0002]

[Description of the Prior Art]In construction of the conventional dome, for example according to the curved surface of the plane of structure of the dome to build, as shown in drawing 6, join the pre cast board 10 of an approximately rectangle so that it may arrange in the direction A of latitude lines, and. To the longitudinal direction B, it joins so that it may gather towards the peak, and the hemispherical dome shell engine frame is constituted.

[0003]At this time, junction of the pre cast board 10 above is carried out by combining the steel materials built in the board 10 by a sleeve or welding.

[0004]

[Problem(s) to be Solved by the Invention]However, in the above dome shell engine frames, in the case of construction, construction of welding etc. is needed for junction of pre cast board 10 comrades which form a plane of structure, time and effort is taken and there is a problem that cost starts. This invention was made paying attention to the above problems, and aims to let junction of the sheet members which form a plane of structure provide the dome shell engine frame of a simple structure.

[0005]

[Means for Solving the Problem]To achieve the above objects, a dome shell engine frame of this invention, Two or more sheet members which are fabricated by approximately trapezoidal shape and have a tenon or a mortise in a top-and-bottom-ends side, respectively, The upper and lower sides are conversely turned by turns in the direction of latitude lines of dome shell to build, and it is arranged, and is attached at it, and it is joined up and down by longitudinal direction of dome shell to build via the above-mentioned tenon or a mortise, and is characterized by being put upon \*\* in it.

[0006]

[Function]It is putting in order and attaching by turns the sheet member of approximately trapezoidal shape, and the sheet member of the approximately trapezoidal shape made to do a handstand in accordance with the direction of latitude lines, if it is in the dome shell engine frame of the invention in this application, It will be in the state where it set its teeth mutually, and is joined, the end faces of the side of a sheet member have, and the plane of structure of ring shape is formed in accordance with the direction of latitude lines.

[0007]\*\*\*\*\* is used to a longitudinal direction, and by fitting in an up-and-down tenon and mortise mutually, or connecting between the mortises which counter up and down by tenon material, it is joined simply, it has, and the dome shell engine frame is constituted as a whole.

[0008]

[Example]The example of this invention is described based on a drawing. In the sheet member used since the plane of structure of a dome shell engine frame is constituted. Two kinds such as the 1st sheet member 1 that consists of precast slab fabricated by approximately trapezoidal shape as shown in drawing 2 (a), and the 2nd sheet member 2 that consists of precast slab fabricated by the approximately trapezoidal shape which did a handstand as shown in drawing 2 (b) are used.

[0009]It is the curved surface doubled with the plane of structure of the dome which the two mortises 1a and 2a are established up and down in an axis, respectively, and the surface of the sheet members 1 and 2 constitutes, respectively in the top-and-bottom-ends side of two kinds of the sheet members 1 and 2. And as shown in drawing 3, on the predetermined foundation 3, the 1st sheet member 1 is made to arrange in parallel in accordance with the direction A of latitude lines of the dome which opens the interval which can insert the 2nd sheet member 2, and is built, and is installed.

[0010]hanging this 1st sheet member 1 and taking down on the foundation 3, at this time, so that two or more tenon material may be made to protrude beforehand in accordance with the direction A of latitude lines of the dome to build and that tenon material may insert in the mortises 1a and 2a of the lower end surface of a sheet member \*\*\*\* -- etc. -- it is good to carry out and to fix this 1st sheet member 1 to the foundation 3. Next, between the 1st sheet member 1 of the above, it hangs from a top, and it is crowded, the 2nd sheet member 2 is inserted in, and the plane of structure of the 1st layer which became ring shape is formed as a state engaged to the 1st sheet member 1 and mutual.

[0011]Next, after inserting the tenon material 4 in the mortises 1a and 2a of the upper bed side of the sheet members 1 and 2 which form the 1st above-mentioned layer, respectively and making this tenon material 4 into state protruding, the above-mentioned sheet members 1 and 2 -- abbreviation -- the 1st smaller sheet member 5 and the 2nd sheet member 6 of similar figures, [ prepare and ] Like the above, in accordance with the direction A of latitude lines of the two-layer eye in the dome shell to build, to up to the sheet members 1 and 2 of the 1st layer which built [ above-mentioned ], as shown in drawing 4, the 1st sheet member 5 is hung intermittently and accumulated.



[0012]The inside of the two mortises 5a established to the lower end surface of the 1st sheet member 5 to load at this time, The 1st sheet member 5 of a two-layer eye is accumulated on \*\* on the sheet members 1 and 2 of the 1st layer via the tenon material 4 by taking down so that one mortise may be made to counter up and down with the mortise 1a of the 1st sheet member 1 of eyes further and the mortise of another side may be made to counter the mortise 2a of the 2nd sheet member 2 of eyes up and down further.

[0013]Next, between the 1st sheet member 5, hang the 2nd sheet member 6 from a top, take it down, and it is inserted in, and the tenon material 4 which has projected the mortise 6a of the lower end surface from the sheet member 1 of the 1st layer and 2 upper-bed side is made to insert, and it fixes, and it has and the plane of structure of a two-layer eye is formed. Using the sheet member which designed the size for the above-mentioned construction small one by one, it loads in layers along the longitudinal direction B one by one to the crowning of the dome shell to build, and a desired dome shell engine frame is built.

[0014]Thus, in the dome shell engine frame of this example. Since sheet members are joined by field contact by predetermined intensity via a mortise only by hanging two kinds of sheet members from a top, taking them down, and attaching them, the bonding operation between sheet members becomes simpler than before, the process for dome shell construction is shortened, and cost becomes low.

[0015]The dome shell engine frame built as mentioned above serves as structure as shown, for example in drawing 1 and drawing 5. In this drawing 1 and the dome shell framework structure of drawing 5, how to the longitudinal direction B of the above-mentioned explanation to put is changed, and it is putting so that the 2nd sheet member 6 of a two-layer eye may lap up and down on the 1st sheet member 1 of the 1st layer. Thus, as long as even the phase of the direction A of latitude lines between the up-and-down layers which touch has shifted, other pellmell placing \*\*\*\*\* may be used for pellmell placing \*\*\*\*\* to the longitudinal direction B.

[0016]Rather than a design line, it bends caudad and between sheet members is stuck more by prudence of a sheet member by pressure, so that it goes to the upper layer. Although the mortises of an up-and-down sheet member are connected by the tenon material 4, in the above-mentioned example, it fabricates so that tenons, such as steel materials, may be made to protrude beforehand from either the upper bed side of a sheet member, or a lower end surface, and may be made to connect directly in it.

[0017]

[Effect of the Invention]As explained above, in the dome shell engine frame of this invention, junction between sheet members becomes simple, and the process of engine-frame construction is shortened and it is effective in cost becoming low.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the side view abridged in part showing the dome shell engine frame of the example concerning this invention.

[Drawing 2] It is a figure showing the sheet member of the example concerning this invention.

[Drawing 3] It is a figure showing attachment to the direction of latitude lines of the 1st layer of the example concerning this invention.

[Drawing 4] It is a figure showing attachment of the two-layer eye of the example concerning this invention.

[Drawing 5] It is the top view abridged in part showing the dome shell engine frame of the example concerning this invention.

[Drawing 6] It is the side view abridged in part showing the conventional dome shell engine frame.

[Description of Notations]

1 and 5 The 1st sheet member

2 and 6 The 2nd sheet member

1a, 2a mortise

4 Tenon material

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[Translation done.]

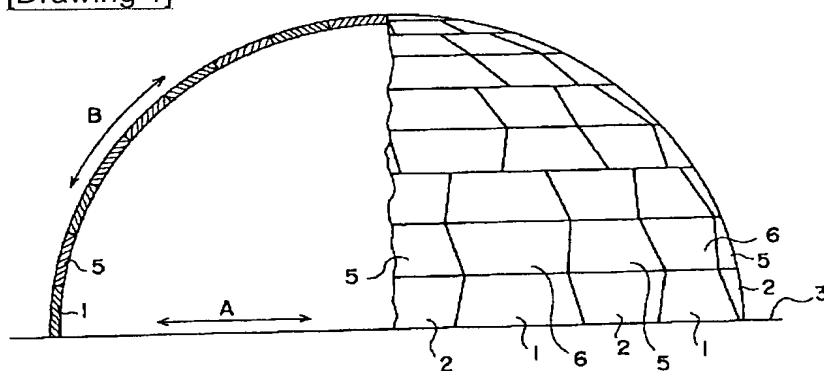
## \* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

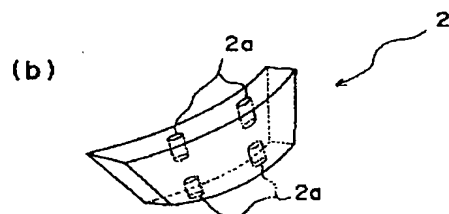
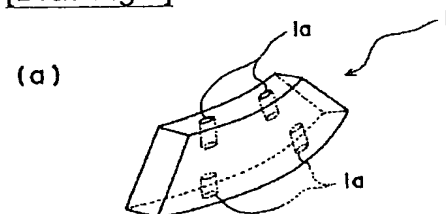
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

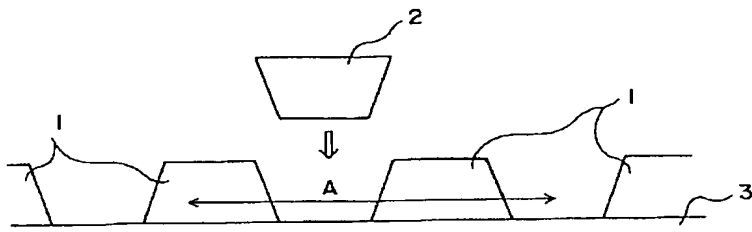
[Drawing 1]



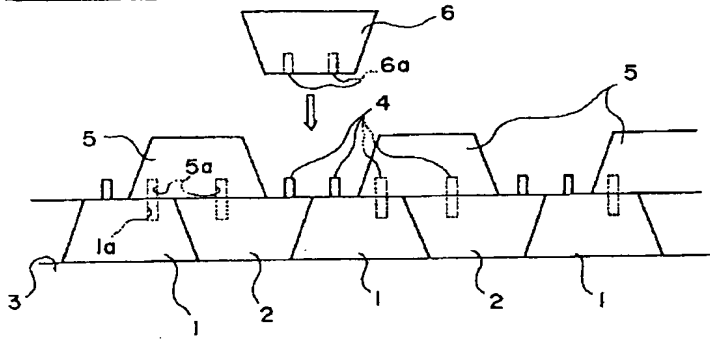
[Drawing 2]



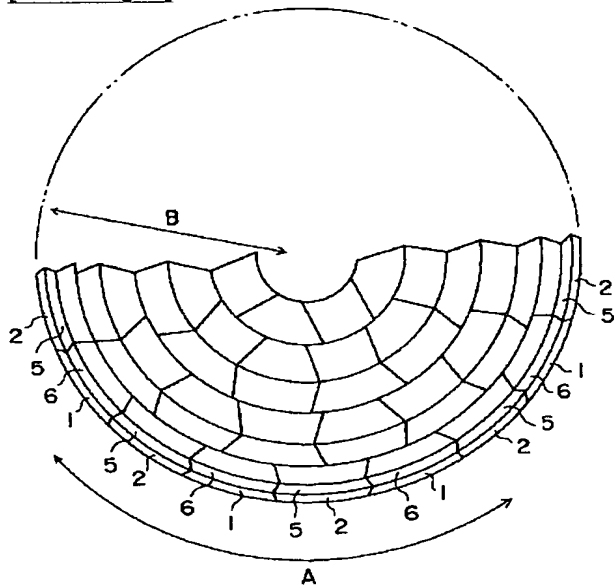
[Drawing 3]



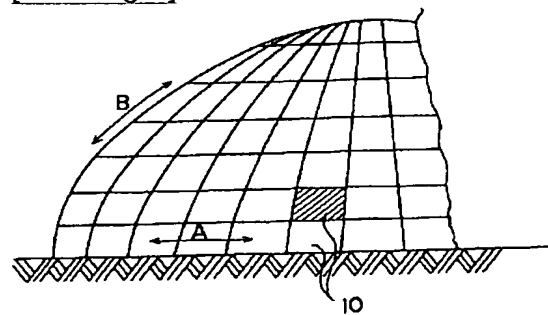
[Drawing 4]



[Drawing 5]



[Drawing 6]



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[Translation done.]